EARTH SUMMIT+5

Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21

New York, 23-27 June 1997

The United Nations Convention on Biological Diversity: A Constructive Response to a Global Problem

Species Loss — The Environmental Problem

"If people want to live in a world that is more than pigeons, rats, cockroaches and starlings, we need to do more than set aside land .... We have to protect endangered species before they are destroyed."

Carter Roberts,
Vice President of the Nature Conservancy

Biodiversity — the variety of plant and animal species present in the natural environment — is not only fundamental to the quality of human life. It is essential for human survival. Goods and services such as food, clothing, housing and medicines are derived from diverse biological resources. Advances in biotechnology have also led to many new medical and agricultural applications, all dependent on biologically diverse sources.

Forests, grasslands, tundras, deserts, rivers, lakes and seas are home to most of earth's distinct biological species; however, the variety of species on earth is threatened chiefly by environmental degradation. Mass extinctions are being reported with increasing frequency worldwide, at a rate that far exceeds the appearance of new species. According to the Global Biodiversity Assessment (GBA) released by the United Nations Environment Programme (UNEP) in November 1995, almost three times as many bird and mammal species alone — 112 — became extinct from 1810 to 1995 were lost between 1600 and 1810 — 38 species. The loss of other life forms, such as mollusks, plants, fish and insects, numbers in the thousands.

Factors contributing to species loss include habitat destruction, invasion of new habitats by non-native species, global warming and depletion of the ozone layer in the atmosphere. In the latter case, life-destroying ultraviolet rays threaten human, animal and plant life on land and in the oceans.

Action to promote sustainable development worldwide, including efforts to halt the loss of biodiversity, will be the focus of a special session of the United Nations General Assembly, when it meets in New York from 23 to 27 June 1997. "Earth Summit + 5", as the special session is called, will review and appraise implementation of Agenda 21, adopted by the UN Conference on Environment and Development, popularly known as the Earth Summit, held in Rio de Janeiro, Brazil, in 1992. Agenda 21 contains strategies for preventing environmental degradation and establishing a basis for a sustainable way of life.

Habitat Destruction

Disappearance of natural habitats, especially tropical forests, is the primary cause of species loss. This is mainly the result of human action: deforestation, air and water pollution, ocean dumping of waste and the side effects of development in general — all of which are linked, indirectly or otherwise, to the growth of human population. According to the GBA, in the early to mid-1980s, humid tropical rain forests were losing nearly 25 million acres each year (10 million hectares), just under 1 per cent globally. These forests

UNITED NATIONS

cover only 7 per cent of the Earth's surface but provide habitats for 50 to 80 per cent of the planet's species. For example, in a typical 2,500-acre area of tropical rain forest, some 1,500 species of flowering plants, 750 different tree species, 400 bird species and 150 different butterfly species can be found.

Alien Invasion

Second only to habitat destruction as a cause of species loss is "alien invasion", which can occur when plants or animals from one ecosystem are introduced into another. In the new environment, they often destroy indigenous species if diseases, predators or pests that usually inhibit them are absent. In Hawaii, for example, imported pigs (now wild) have decimated native plant species, and strict controls have been established there regarding the importation of animals and plants.

Food and Agricultural Biodiversity

Indigenous food crops, naturally resistant to pests or bad weather, have been lost due to the widespread promotion of relatively few crop varieties along with the expanded use of fertilizers, pesticides and herbicides.

Reducing the genetic varieties of food crops as a result of breeding for higher yields can also be dangerous, increasing the vulnerability of crops to disease and pests. According to the World Resources Institute, U.S. farmers lost $1 billion in 1970 due to a disease that decimated uniformly susceptible corn crops. Other losses stemming from a lack of genetic diversity afflicted a large part of the Soviet wheat crop in 1972 and the 1984 citrus crop in Florida. If a variety of crops are planted, a disease or blight may attack a vulnerable species but will probably be less destructive of others.

Since 1900, about 75 per cent of the world's crop varieties have become extinct, and around 50,000 disappear each year according to the Food and Agriculture Organization (FAO). At present, the world's population gets 90 per cent of its calories from 20 crop species; four of these account for 50 per cent of total calories (rice, maize, wheat and potatoes).

Although FAO supports increasing food production to meet global needs, it emphasizes that "intensified food production can be achieved by the sustainable use of a broader range of genetic material".

The Economic Problem

The loss of biological diversity endangers the delicate balance of nature that supports life on Earth and deprives humanity of substances needed to produce new medicines, crop varieties and other products through biotechnology. About 25 per cent of all prescription medications used in the United States contain active ingredients derived from plants. Roughly 5,100 plant species are used in traditional medicine in China, while 2,500 are used in the former Soviet Union.

To preserve the genetic stock of potentially important plants and animals, existing species must be protected from extinction. Reasonable harvesting of biological resources combined with measures to ensure their renewal is essential for sustainable economic growth and poverty reduction around the world. Governments tend, however, to view economic development and environmental protection as conflicting objectives, with development needs usually taking priority, as in the case of forests.

Most of the world's tropical rainforests are located in developing countries, where they are under extensive pressure from developers who want wood for export and construction as well as from citizens in need of fuel for heating and cooking or who seek agricultural or grazing land. Foreign debt burdens and lack of access to affordable modern technologies further exacerbate the pressures on developing countries to exploit their biological resources. If resources such as hardwood forests in one country are protected, companies will try to harvest the needed timber in a second country, often destroying significant portions of forest in the process. The World Resources Institute estimates that from 1960 to 1990, one-fifth of all natural tropical rainforest cover was lost. Although forested areas in developed countries seem to have stabilized, the Institute estimates that only 40 per cent of Europe's original forest cover remains.

Sustainable development — that which meets the needs of the present without compromising the needs of future generations — is the key to reconciling the conflict between economic and environmental goals. Short-term market values of products based on biological resources need to be measured against accurate assessments of the longer-term value of renewable biological resources, and of the natural habitats that produce them. Care must be taken to preserve and replenish

the raw materials of a biologically diverse and healthy environment.

The Political Problem

Traditionally, wealth has been created in the developed countries by exploiting the resources of the natural environment and transforming them into products used and desired by human beings. This has often been done with little regard to the consequences and has resulted in widespread environmental damage and destruction. Although the developed countries generally profess support for environmental conservation and protection, they still consume most of the world's natural resources and seek to exploit the resources of the developing countries of the South.

The primary goal of the developing countries is economic development and poverty alleviation. Although recognizing the importance of environmental protection, they generally give priority to income-generating activities, feeling that the developed countries should contribute to the cost of sustainable development by providing resources and technology needed for environmentally friendly development. Developing countries also contend that they should share financially the results of genetic engineering using their biological resources. So the basis for the political debate between North and South is largely economic.

Financing

In Agenda 21 (chapter 33, section IV), developed countries reaffirmed their commitment to reaching, as soon as possible, the United Nations target of 0.7 per cent of gross national product (GNP) annually for official development assistance (ODA). The Commission on Sustainable Development is monitoring progress towards achieving this target, which some countries have agreed to reach by the year 2000. According to the most recent figures available in the 1996 Human Development Report of the UN Development Programme (UNDP), the total world ODA in 1994 was $59.16 billion, or an average of .3 per cent of world GNP. Unfortunately the overall level of ODA appears to be declining and is not expected to increase in the near future.

The Global Environment Facility (GEF) was established in 1991 by donor countries through a World Bank resolution. Located in Washington, D.C., the GEF, which began as a pilot programme, was restructured in 1994 to provide grant and concessional funding for action to improve the global environment in the areas of climate change, biological diversity, international waters, and ozone layer depletion. On an interim basis, the GEF operates the financial mechanisms for the United Nations Framework Convention on Climate Change and the Convention on Biodiversity. It is estimated that the GEF's implementing agencies (UN Development Programme, the UN Environment Programme and the World Bank) will be able to undertake GEF-related projects amounting to $340 to $415 million in 1997. Funds are contributed to the GEF by both donor and recipient Governments.

The Convention

The United Nations Convention on Biological Diversity (CBD) was opened for signature at the United Nations Conference on Environment and Development in June 1992 and became legally binding on 29 December 1993. As of 3 December 1996, 165 countries, including the European Union, had ratified the Convention.

The purposes of the Convention are to conserve biological species, genetic resources, habitats and ecosystems; to ensure the sustainable use of biological materials; and to provide for the fair and equitable sharing of benefits derived from genetic resources.

Included in the Convention are provisions for both "ex-situ conservation" — conservation of biological elements outside their natural habitats — and "in-situ conservation" — conservation of ecosystems and natural habitats and the maintenance of species in their natural surroundings. Maintenance of natural habitats is essential for the conservation of biologically diverse species which would otherwise face extinction.

Convention Provisions

The most important provisions of the Convention include:

- The requirement that countries adopt regulations to conserve their biological resources;
- The legal responsibility of Governments for the environmental impact in other countries of activities within their jurisdiction, including those of private corporations;
- Funding to assist developing countries in implementing the Convention's provisions (to be

administered through GEF, pending the determination of a permanent institutional structure);

- The transfer of technology to developing countries on preferential and concessional terms, where such transfer does not prejudice intellectual property rights or patents;
- Participation in biotech research by countries providing genetic resources;
- Fair access to benefits of genetic research by countries providing genetic resources;
- Compensation to developing countries for extraction of their genetic materials;
- Commitment to build capacity in developing countries to implement the Convention through training, awareness-raising and technology transfer exercises.

Conference of Parties

Established by Article 23 of the Convention, the Conference of the Parties to the United Nations Convention on Biodiversity (COP) is mandated to review the Convention's implementation; to assess scientific, technical and legal advice on biological diversity; and to establish subsidiary bodies as necessary. The COP also considers and adopts amendments and protocols to the Convention as necessary.

The first meeting of the Conference of Parties (COP-1) took place from 28 November to 9 December 1994 in Nassau, the Bahamas. Delegates agreed on basic machinery for implementing the Convention, including designation of a permanent secretariat, establishment of the subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and designation of GEF as the interim financial mechanism for the Convention (see above).

At the second meeting of the Conference of Parties (COP-2), held in Jakarta, Indonesia, from 6 to 17 November 1995, Governments decided to locate the secretariat, administered by UNEP, in Montreal, Canada. They also established a clearing-house mechanism, and a "bulletin board" for sharing information, and agreed to develop a protocol on biosafety. This meeting also established a programme to address the issues of marine and coastal biodiversity as well as forests and biodiversity and to provide input to the Intergovernmental Panel on Forests (IPF).

COP-3, held in Buenos Aires, Argentina, from 4 to 15 November 1996, established work programmes on agricultural biodiversity and on forest biodiversity, agreed on a Memorandum of Understanding with the GEF, decided to hold an intersessional workshop on Convention Article 8(j) (traditional knowledge, innovations and practices of indigenous and local communities), and called for the Convention's Executive Secretary to apply for observer status to the World Trade Organization's (WTO) Committee on Trade and the Environment.

Issues and Views

In spite of the Convention's entry into force and the achievements of the process so far, considerable challenges remain on many key issues. These include effective measures to conserve habitats, adequate funding for developing countries to conserve bioresources and habitats, compensation for and access to biological resources and knowledge used to produce new products, mechanisms to ensure biosafety and international agreement on the issue of patenting life-forms. At the same time, there is a trend among States towards informal arrangements and pragmatic approaches to solving problems.

Access to Biological Resources and Technology Ownership and Patent Rights

Roughly two thirds of all plant and animal species are found in developing countries, with over 90 per cent of plant species located in Africa, Asia and Latin America. But private companies in the industrial countries have most of the expertise and resources needed to exploit these biological and genetic resources. Commercial products based on biodiversity include scientifically bred seeds, medicines and cosmetics. Profits generally go to those holding patents and to Governments that issue them. Companies are guaranteed profits on their investments only if they have exclusive rights over the biological ingredients, including genes, and the technological manufacturing process. These intellectual property rights (IPRs) are protected by patents, national laws (including plant breeders' rights legislation), and international agreements.

Developed countries and businesses defend their right to compensation under intellectual property law for risks and expenses involved in research and development. Scientists may work for several years on researching potential medicines or other products without a marketable result. To promote and maintain economic growth, developed coun-

tries wish to ensure that obligations placed on private firms do not constitute barriers or disincentives to research and production. For example, the United States has not agreed to technology transfer at below-market rates, as it feels that would impose an unfair burden on the private sector.

Conversely, developing countries possessing the biological resources upon which research depends feel they are entitled to just compensation for the benefits gained from these resources. Frequently researchers simply hunt for biological resources wherever they can find them and use them without compensation to the host country or people — although some companies have established compensation mechanisms with host countries.

To address this issue, the Convention proposes that measures be taken to ensure the fair and equitable sharing of the results of research and development on genetic resources with the country providing access to such resources. This could take the form of low-cost transfer of biotechnologies, funding for training technical professionals and/or royalty payments on the sale of products made with biological resources obtained from a given country. UNEP has recommended that there be free access to and fair compensation for both genetic resources and biotechnologies.

Specific legislation on access to genetic resources and benefit-sharing has been introduced in the Philippines, the Andean Pact countries (Bolivia, Colombia, Ecuador, Peru and Venezuela), Australia, Brazil, Cameroon, Fiji, Guatemala, India and Malaysia.

An example of an access agreement that could be a model for future agreements is the $1.1 million, two-year deal between Costa Rica and Merck, a large pharmaceutical company. Under this arrangement, a Costa Rican quasi-governmental organization, INBio, agreed to provide Merck with 10,000 biosamples from nature parks in the country. If profitable drugs are developed from Merck's scanning of these substances, the company has agreed to pay Costa Rica an undisclosed percentage of the royalties. Although some observers believe that Costa Rica could earn more in royalties from this agreement than it does from its coffee or banana crop exports, critics contend that Costa Rica may profit from plant materials that can also be found in neighbouring countries. It is also not clear what benefits will go to the indigenous people in the area.

Intellectual Property Rights and Indigenous Knowledge

Aside from benefit-sharing as it relates to biological resources, there are unresolved questions surrounding the issue of intellectual property rights versus indigenous knowledge. The Convention recognizes the value of indigenous and local knowledge, as it contains insights into biological resources and ecosystems and is potentially valuable in the development of medicines, food and other products. Two different world views are reflected: on the one hand is the system of marketable, systematic recorded knowledge based in the legal systems of developed countries; on the other is indigenous knowledge and know-how, often based in an oral tradition, grounded in a sense of oneness with the environment and somewhat resistant to the idea of "selling" knowledge.

To attempt to bridge this gap, COP-3 requested parties to the Convention to develop legislation to implement Article 8(j) on traditional knowledge and indigenous practices, in consultation with indigenous and local communities. The Group of Indigenous Peoples called for an immediate moratorium on bioprospecting and said they were not satisfied with the decision taken by COP-3, presumably because of opposition to the commodification of the knowledge or biological resources developed or maintained by indigenous cultures. Also at COP-3, the European Community called for exploring the development of IPR systems and contractual mechanisms to better value indigenous knowledge. Others have suggested creating new IPR systems or other mechanisms to protect traditional knowledge.

Farmer's Rights

Another major concern of developing countries and farmers in both developing and developed countries is the practice of patenting life forms. At present there is no universal agreement on what can be patented and what cannot. The United States, for example, was the first country to allow the patenting of plants, but this is still not allowed under Indian law.

Under the terms of the 1978 International Convention for the Protection of New Varieties of Plants, as amended in 1991, farmers' rights to save seeds from one harvest to plant for the next one are in question. Seeds that have been modified and improved by farmers over the years have been the object of further improvements by transnational corporations (TNCs). Although in the farmers' case

there had usually been no question of patenting their improved seeds, TNCs often try to patent TNC improvements as original inventions. When such patents are granted, TNCs holding them often can insist that farmers wishing to use the patented seed must buy it from the TNC, often at premium prices, or pay royalties. In some cases, seed has been genetically modified to preclude crop-produced seed from germinating, so as to require the purchase of new seed for each new crop.

To balance the situation, the Agreement on Trade-Related Intellectual Property Rights (TRIPS) of the World Trade Organization allows Governments to develop their own plant-protection legislation. Countries thus have the right and the opportunity to enact laws to safeguard commercial plant varieties while protecting the interests of farmers and indigenous people.

Supporters of IPR protection in biological materials contend that the biotechnology industry provides many of the tools for environmentally sustainable growth and argue that such protection will promote the production of competing and diverse genetic solutions to problems. Opponents of patenting these materials feel that this type of IPR protection will further encourage genetic uniformity in agriculture and the resulting loss of biodiversity, as a major research objective is the expansion of crop yields, at the expense of crop diversity.

Biotechnology and Biosafety

It is theoretically possible for genetic engineers to take a gene from any biological source and place it in any other. This process has already resulted in new medicines such as human insulin and growth hormones and shows great potential for new vaccines and drugs to fight disease.

As new creations emerge from biotech labs, however, there is a need for biosafety practices to guard against unintended consequences. Without adequate safeguards, genetically engineered organisms, when introduced into the environment, could cause destruction. To minimize this possibility, production and release of such agents need to be carefully controlled. So far, however, international agreement has not been reached on controlling the release of genetically modified organisms (GMOs).

GMOs cannot be recalled from the environment once introduced and could pose potential risks if released. For example, they could serve as channels for new foreign genes to move into wild plants. Crops, altered to produce drugs, and pesticides could be hazardous to other organisms, and crops engineered to tolerate harmful pesticides could increase pesticide use. Modified crops could also become pests in nature if their ability to survive is improved.

To address this problem, UNEP has prepared International Technical Guidelines for Safety in Biotechnology focusing on the transboundary movement of living modified organisms until a protocol on biosafety is finalized in 1998 — a goal set by COP-3. During the debate at COP-3, Cameroon, Mexico, New Zealand, Russia, Tanzania, Tunisia, the United Kingdom and Zimbabwe emphasized the need for capacity building in biosafety. Morocco called for funding for biosafety in developing countries, while Italy, Malaysia and Switzerland endorsed the UNEP Guidelines. Brazil said it would support the Guidelines until the protocol is completed.

Technology Transfer

Biotechnology requires the application of expertise in the areas of molecular biology, biochemistry and genetics; it is based to a large extent on expertise and knowledge, not on hardware. Even small countries with limited industrial capacity can therefore move to the frontiers of biotechnology by building up their human-resource capacity through training and research. Using such expertise to screen and classify their genetic resources, developing countries can strengthen their ability to develop new products.

Foreign direct investment is the most significant means of transferring or acquiring technology, accounting for more than 60 per cent of the flow of technology to developing countries. Other methods for transferring biotechnology, sustainable-use technologies and conservation technologies include turnkey projects, joint ventures, licensing, wholly-owned subsidiaries, joint research and development arrangements, training, information exchanges, sales contracts and management contracts.

At COP-3 many countries stressed the need for capacity-building in developing countries, with the European Union calling for the establishment of an international framework to facilitate cooperation in technology transfer.

Published by the United Nations Department of Public Information •
Printed on recyled paper by the United Nations Reproduction Section, New York
DPI/1869/SD—97-01261—January 1997—15M